

TENMILE CREEK (VI AA 440) 2008 ELECTROFISHING SURVEY

Report prepared by:
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Background: Tenmile Creek is a tributary of the Sevier River on the east slope of the Tushar Mountains. The stream is generally isolated from the river by dewatering in the lower stream for irrigation. Much of the length of the creek lies within the Fishlake National Forest (FNF), while the lower reach runs through BLM and SITLA lands (Fig. 1). Prior to 2000, Tenmile Creek contained a wild population of rainbow trout. The stream was identified as a suitable location for the replication of the remnant Bonneville cutthroat trout (BCT) population in Deep Creek (VI AA 510 G 01) and plans for the renovation proceeded with the construction of a fish migration barrier in 2000 and rotenone treatments to remove rainbow trout in 2000 and 2001. In 2002, regional personnel feared that flash floods after the Sanford Fire would decimate the Deep Creek population. Most of the remaining BCT in Deep Creek were salvaged and moved to Tenmile Creek in June 2002. Since 2002, BCT have established well in Tenmile Creek. Annual observations have noted very successful natural recruitment. BCT from both the lower and upper reaches have been transferred to Deep Creek to re-establish that population. Additional transfers to newly renovated streams are planned for coming years. The only formal sampling of Tenmile Creek since BCT were introduced was conducted by FNF personnel in 2004.

Methods: Stations 2 (in meadow area 1.6 km downstream of Bumblebee Spring; Fig. 5) and 3 (0.75 km downstream of Bumblebee Spring; Fig. 7) were established in 2004 (Fig. 1). After the 2004 sampling, it was determined that an additional station was needed to monitor BCT the lower reaches of Tenmile Creek. Station 1 was established in 2008 and was located 1.1 km upstream (west) of the FNF boundary (Fig. 1, 5). Electrofishing surveys were conducted by UDWR and FNF personnel at these three stations on July 31, 2008. At each station, a two-pass depletion was conducted using a battery-powered backpack electrofisher (Smith-Root model 12-B). All trout collected were measured (mm), and weighed (g), and returned to the stream. Ten wetted stream widths were measured at each station. Mean length (mm), weight (g), and condition (K_{TL}) were calculated for each station. Population estimates were calculated by the program MicroFish.

Results: BCT were the only fish collected in all three stations (Fig. 6). Table 1 displays population estimates, mean size measures, and other results from the 2008 electrofishing survey. At least three cohorts of BCT were observed at each station (Fig. 2-4). Station 2 had the highest mean size (total length and weight), condition (K_{TL}), and biomass (kg per hectare), as well as the lowest density (fish per hectare). BCT density was highest at

Station 1, while biomass was similar at stations 1 and 3. Natural recruitment was fair to good at all stations.

Results of the 2008 electrofishing survey at stations 2 and 3 were compared to those from the previous survey in 2004 (Table 2). Though young-of-the-year BCT dominated the population in 2004, their lengths and weights were not figured into mean results. Subsequently, mean size was lower in 2008 at station 3 and did not differ much at Station 2. At Station 2, BCT density decreased while biomass increased, indicating that the population now includes more large adult fish. Both density and biomass decreased at Station 3. The decrease in abundance may be attributed to the increase in numbers of large fish, habitat limitations, and dispersal of young fish to other habitats. Though decreased, biomass still remains at a good level at Station 3.

Discussion / Recommendations: BCT continue to expand in Tenmile Creek. Natural recruitment should be sufficient to supply fish for planned transfers to Deep Creek, Bullion Canyon, and Deer Creek. An effort should be made to investigate the stream reach above Bumblebee Spring, including evaluating the success of a previous transfer of fish above a partial barrier and evaluating the suitability of expanding the population farther upstream.

Observations from 2000-2008 indicate that low flow and lack of quality pools are the primary limiting factors for trout. Much of the length of Ten Mile Creek is downcut 3-15 feet, entrenching the stream and cutting off access to a floodplain (Fig. 5, 7). This increases erosive energy and limits fish habitat development. The valley bottom and stream banks often are composed of a rock type that breaks down into small, loose gravel. Further compounding this situation is a lack of willows and herbaceous plants such as sedges and rushes that would help hold these non-cohesive banks together. Dense shading from the conifer over story and/or past livestock grazing may be causal factors for the lack of riparian vegetation. ATV access has occurred along the majority of the fish occupied stream; no control work was evident during the 2008 surveys although discussions with FNF district personnel indicate some signage has since taken place.

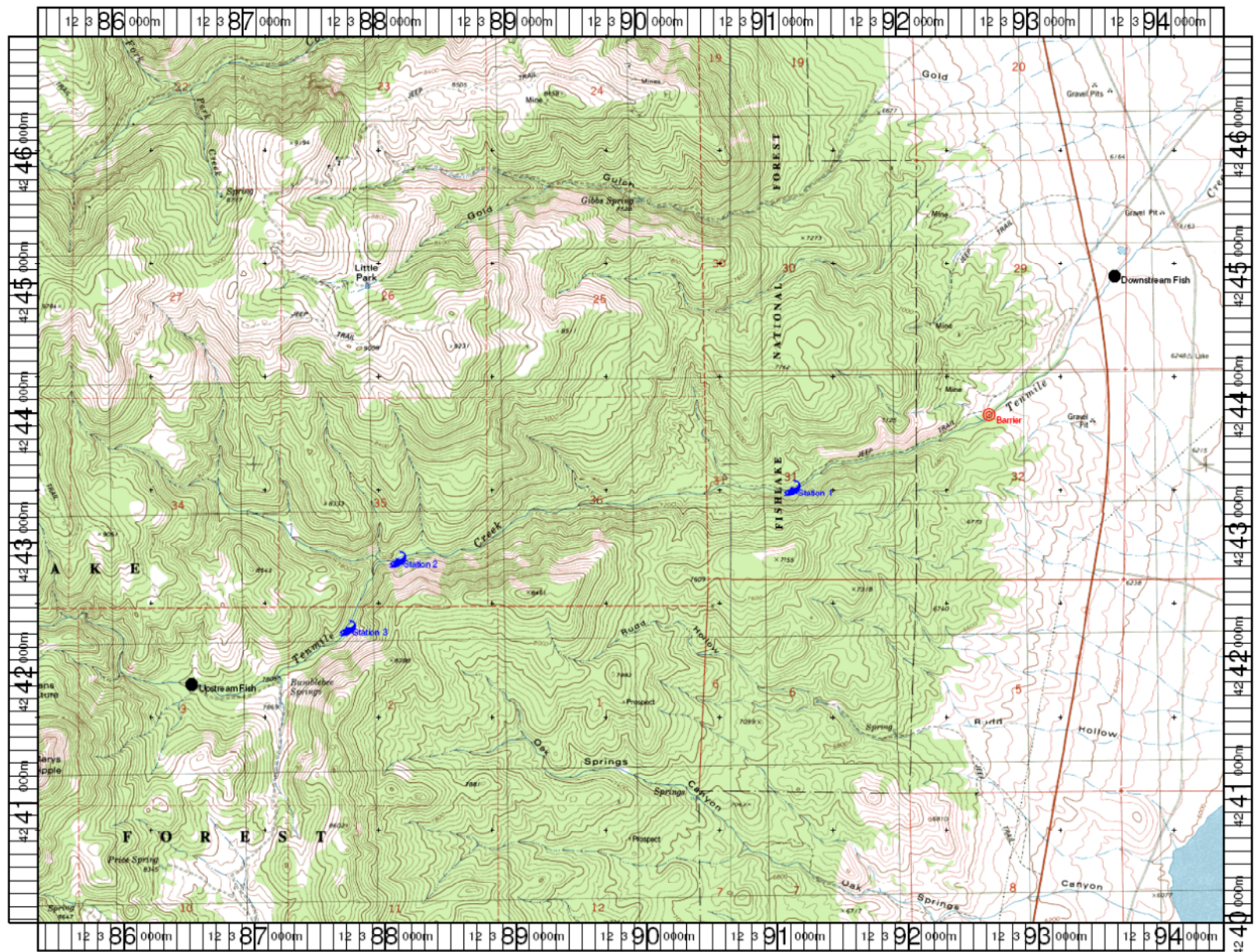


Figure 1. Location of electrofishing survey stations in Tenmile Creek.

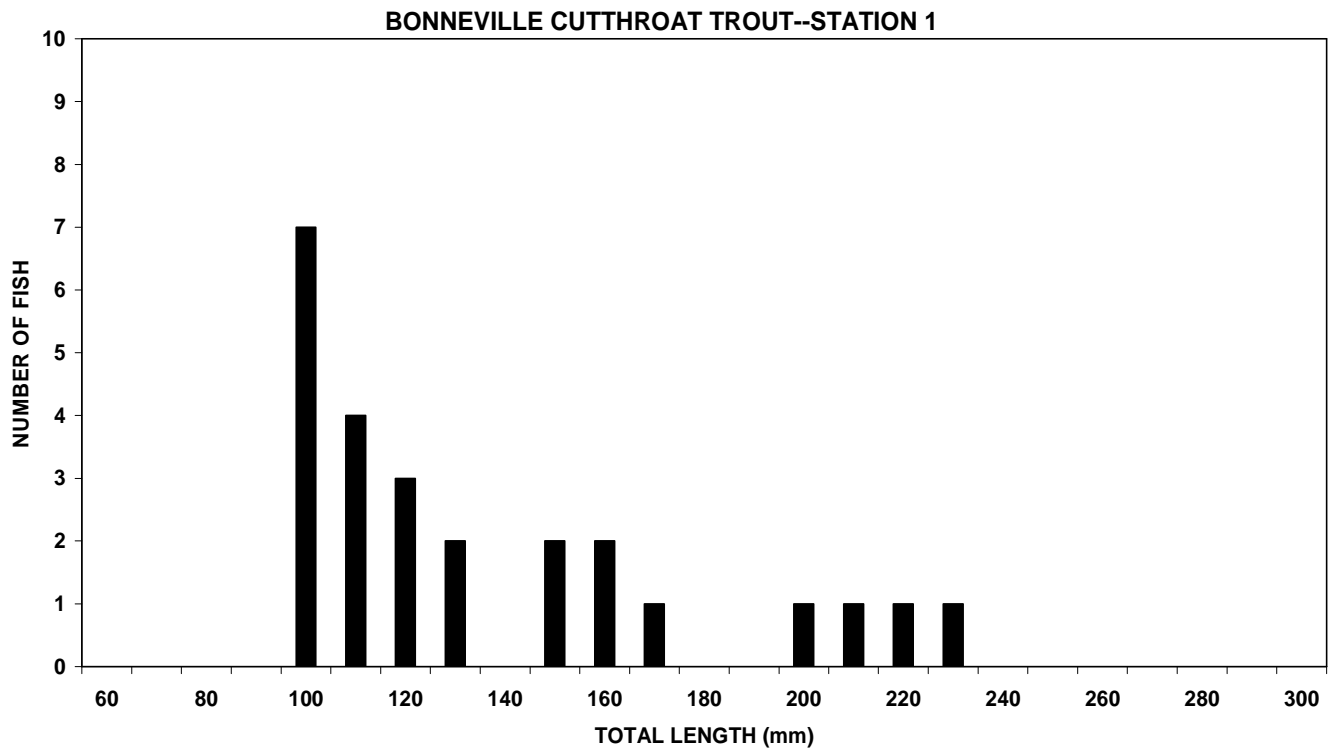


Figure 2. Length distribution of Bonneville cutthroat trout collected in Tenmile Creek, Station 1, on July 31, 2008.

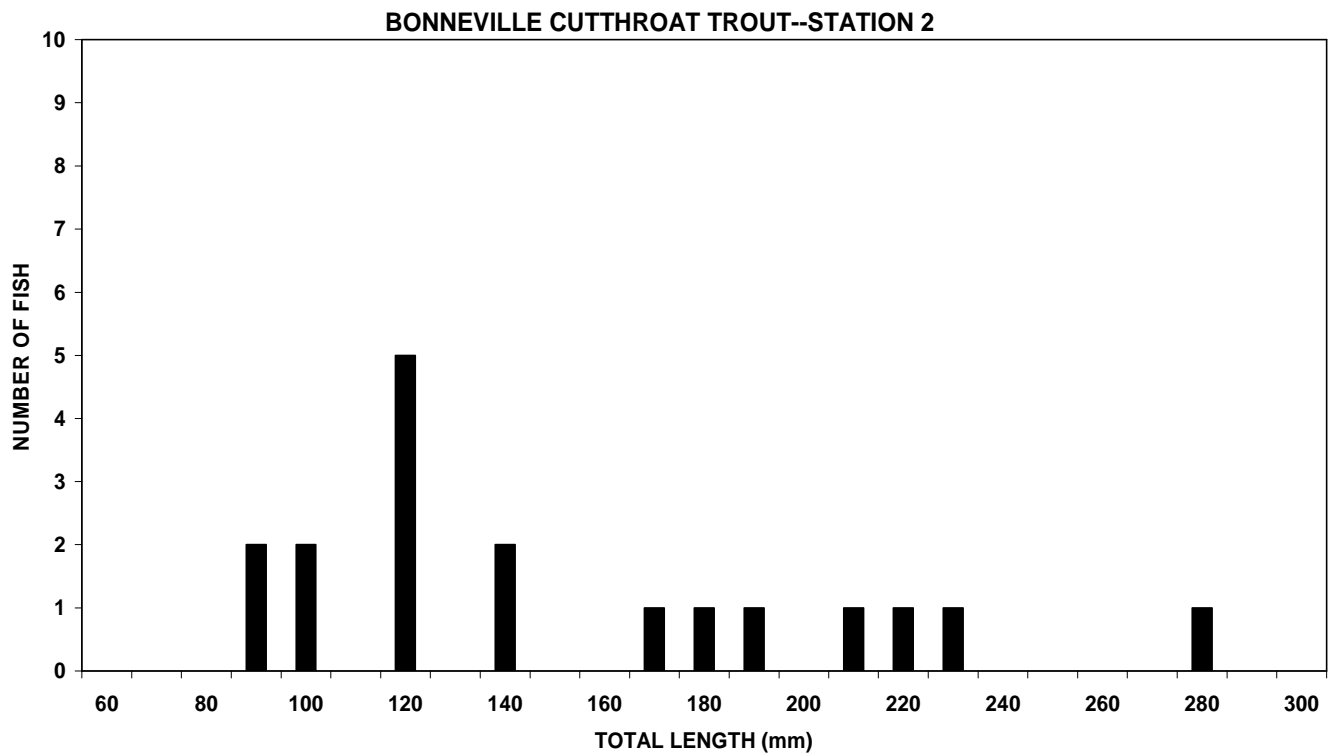


Figure 3. Length distribution of Bonneville cutthroat trout collected in Tenmile Creek, Station 2, on July 31, 2008.

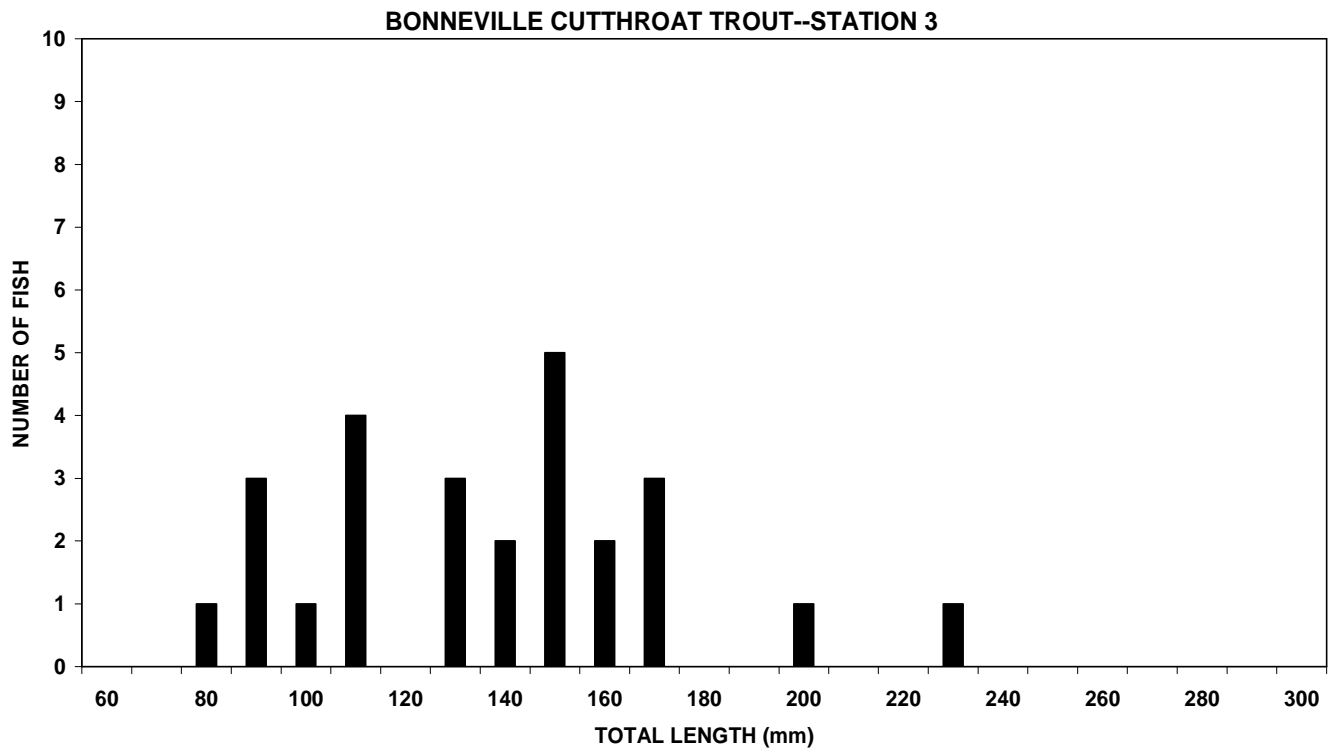


Figure 4. Length distribution of Bonneville cutthroat trout collected in Tenmile Creek, Station 3, on July 31, 2008.



Figure 5. Stations 1 (left) and 2 (right) in Tenmile Creek.



Figure 6. Bonneville cutthroat trout collected at Tenmile Creek, Station 2.



Figure 7. Tenmile Creek, Station 3.

Table 1. Results from the 2008 electrofishing survey in Tenmile Creek.

Tenmile Creek-- NATIVE TROUT POPULATION SURVEY FORM

1. General Information--
 Date: **July 31, 2008**
 Biologist: **M. Hadley, J. Whelan, M. Ottenbacher**
2. Stream Information--
 Name, catalog #, section, county: **Tenmile Creek, VI AA 440, 01, Piute**
3. Survey Site Information (see attached map)--
 Upstream range of native trout (general description and GPS): **just above trail crossing--
 120386542E 4241888N**
 Downstream range of native trout (general description and GPS): **irrigation diversion--
 120393652E 4244944N**
 Location (GPS) and description of barriers: **diversion; constructed barrier--
 120392682E 4243883N**
 Stream Length--
 Occupied habitat: **9.3 km** Available habitat: **10.6 km**
 Survey method & equipment: **backpack battery electrofisher; two pass depletion**
 Survey sites (general description and UTM)--
 Station 1: **1.1 km upstream of Forest boundary; 120391153E 4243335N**
 Station 2: **meadow 1.6 km downstream of Bumblebee Spring; 120388122E
 4242829N**
 Station 3: **0.75 km downstream of Bumblebee Spring; 120387728E 4242306N**

Parameter	Station 1	Station 2	Station 3	Station 4
Station length (m)	100 m	100 m	100 m	
Mean stream width (m) (n)	1.21 m	1.33 m	1.47 m	
Station area (hectares)	0.0121	0.0133	0.0147	
<u>Bonneville Cutthroat Trout</u>				
Removal Pattern	23 2	18 0	24 2	
Population estimate (95 % CI)	25 (25-26)	18 (NA)	26 (26-27)	
Capture probability	0.926	1.000	0.929	
Mean length (mm) (n)	131 (25)	149 (18)	134 (26)	
Mean weight (g) (n)	28 (25)	56 (18)	31 (26)	
Mean ktl (n)	1.02 (25)	1.15 (18)	1.04 (26)	
Number fish per km	250	180	260	
Number fish per hectare	2066	1353	1769	
Biomass (kg per hectare)	57	76	54	

4. Comments:

Other species sampled:

Table 2. Comparison of electrofishing survey results from 2004 and 2008 at stations 2 and 3 in Tenmile Creek. ^a—Did not measure or weigh YOY. ^b—Did not include YOY in means.

<u>Measure</u>	<u>Station 2</u>		<u>Station 3</u>	
	<u>2004</u>	<u>2008</u>	<u>2004</u>	<u>2008</u>
<u>Bonneville Cutthroat Trout</u>				
Mean Length (mm)	146 ^a	149	198 ^b	134
Mean Weight (g)	44 ^a	56	110 ^b	31
Mean K _{TL}	1.09 ^a	1.15	1.18 ^b	1.04
Fish per hectare	3000	1353	3333	1769
Biomass (kg/hectare)	49	76	70	54